

The Need for More Research on Language Barriers in Health Care: A Proposed Research Agenda

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Many U.S. residents who speak little English may face language barriers when seeking health care. This article describes what is currently known about language barriers in health care and outlines a research agenda based on mismatches between the current state of knowledge of language barriers and what health care stakeholders need to know. Three broad areas needing more research are discussed: the ways in which language barriers affect health and health care, the efficacy of linguistic access service interventions, and the costs of language barriers and efforts to overcome them. In each of these areas, we outline specific research questions and recommendations.

Key Words: Interpreters, language barriers, patient-clinician communication, review.

We clinicians are better educated and more scientific than ever before, but we have a great failing: we sometimes do not communicate effectively with our patients or with their families. (Tumulty 1970, 22)

THE CONVERSATION BETWEEN PHYSICIAN AND patient has long been recognized to be of diagnostic import and therapeutic benefit. Unfortunately, however, because of

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language barriers, many patients in the United States do not benefit from this interaction. According to the 2000 U.S. Census, more than 46 million people in the United States do not speak English as their primary language, and more than 21 million speak English less than “very well,” representing a 42.3 percent increase from 1990 (U.S. Bureau of the Census 2003). For these residents, there are few bilingual health care providers in practice or in the medical professional pipeline (Sullivan Commission 2004), and most health care organizations either do not provide linguistic assistance services or offer only inadequate services (Association of State and Territorial Offices 1992; Baker et al. 1996; Bischoff et al. 1999; Chak, Nixon, and Dugdale 1984; D’Avanzo 1992; Eytan, Bischoff, and Loutan 1999; Gerrish 2000; Ginsberg et al. 1995; Hayward, Woo, and Kangesu 1991; Lawrenson et al. 1998; Leman and Williams 1999; Madhok, Bhopal, and Ramaiah 1992; Pöchhacker 2000; Rader 1988; Schmidt, Ahart, and Schur 1995; Vandervort and Melkus 2003; Wirthlin Worldwide 2001; Woloshin et al. 1995). As a result, many health care providers rely on other patients, family members (sometimes a small child), friends, and untrained nonclinical employees or nonfluent health care professionals to communicate with their patients (Ginsberg et al. 1995; Schmidt, Ahart, and Schur 1995; Wirthlin Worldwide 2001), despite laws and regulations requiring linguistic access.

Indeed, Title VI of the Civil Rights Act of 1964 requires all entities receiving federal funds to ensure that persons with limited English proficiency (LEP) have meaningful linguistic access to the health services that they provide (Title VI 1964). In addition, many states have laws and regulations that apply to the provision of health care to persons with LEP (Perkins, Youdelman, and Wong 2003). But these laws and regulations are not frequently enforced, and in recent years, the cost and feasibility of these requirements have been much debated, especially whether all health care entities, regardless of size or patient mix, have the same obligations to their LEP patients. Few insurers, public or private, provide reimbursement for these services (National Health Law Program 2003), and many organized medicine groups have protested these requirements, arguing that they constitute an unfunded mandate (Graham 2001; Radcliffe 2001).

Consequently, many health care purchasers, insurers, regulators, and clinicians wonder how or even if they even need to address the issue of language barriers in medical care. Purchasers may question whether it

is worthwhile to press for the inclusion of language assistance services for their employees or beneficiaries. Insurers may question whether these services should be a covered benefit. Regulators may question whether it is important to encourage or mandate the provision of these services and how best to do so, and providers may question whether adequate linguistic services for their LEP patients have a clinical benefit. These questions are compounded by those of feasibility and cost, particularly when the need for linguistic services varies in different geographic, cultural, and clinical contexts. Unfortunately, the current literature addressing these issues does not always offer answers.

The goal of this article is to identify the gaps and weaknesses in the research literature that need to be addressed in order to help purchasers, insurers, regulators, and providers make informed decisions regarding the provision of linguistic access services. Our hope is that our proposals will guide researchers, policymakers, and funders in their data collection and research in this area.

Research Agenda Development

Three broad questions regarding language barriers in health care need to be answered before purchasers, insurers, regulators, and providers can make informed decisions. (1) Do language barriers have important consequences for LEP patients? (2) Do effective interventions to language barriers in health care settings exist, and if so, how do they benefit patients and providers? and (3) What are the costs for patients, providers, insurers, and/or purchasers of offering or not offering effective linguistic access services for LEP patients? We based the following research agenda on our review of the literature and identification of mismatches between the current state of knowledge about language barriers and what health care stakeholders need to know.

The articles we examined for this review we found through two systematic and thorough reviews of the literature (Jacobs et al. 2003; Karliner et al. 2005). Both reviews identified peer-reviewed journal articles through a systematic search of PubMed, PsychINFO, and Sociological Abstracts databases completed in 2003; the reference lists of journal articles identified in the electronic searches; and several bibliographies previously compiled by experts in the field. Both reviews excluded articles that were not peer reviewed or were published in a language other than English.

Although the two reviews overlapped, the more recent one yielded six new articles (Karliner et al. 2005). An additional eight articles were identified in a PubMed search completed on March 29, 2004, for a total of 151 articles. In the interest of space and because some articles had similar findings, this report does not cite all 151 articles. But we used all of them to support our proposed research agenda, and they are available through us.

Literature Review and Proposed
Research Agenda

Table 1 shows the population, setting, and methodological focus of this body of literature. The majority of articles identified in the review are quantitative and focus on Spanish-speaking patients in primary care or emergency department settings in the United States. Spanish was the language most commonly studied. Table 2 shows the distribution of articles according to the topics they address. While 151 articles may

TABLE 1
Language Focus, Setting, and Methodology of Research Articles Addressing
Language Barriers in Health Care

Focus		Number of Articles
Language	Spanish	57 (38%)
	Others ^a	94 (62%)
Country	United States	90 (60%)
	Others ^b	61 (40%)
Setting	Primary Care	51 (34%)
	Emergency Department	23 (15%)
	Others ^c	77 (51%)
Methodology	Quantitative	124 (82%)
	Qualitative	27 (19%)

Notes: ^aBangladeshi, Chinese, Cree, French, German, Gujarati, Hausa, Hmong, Khmer, Portuguese, Punjabi, Russian, Saulteu, Vietnamese, Welsh, Xhosa, and a mix of these or other languages.
^bAustralia, Austria, Canada, England, Nigeria, Scotland, South Africa, Switzerland, and Wales.
^cHospital, obstetrics and gynecology, managed care, mental health, palliative care, pharmacy, psychiatry, specialty care, and surgical care.

TABLE 2
Topic Distribution of Research Articles Addressing Language Barriers in Health Care

Topic	Definition	Number of Articles on Topic
Access Barrier	Studies in which language is investigated as a barrier to obtaining health care services.	28
Adherence	Studies that assess patients' adherence to recommended treatment, such as medication use.	6
Comprehension	Studies that evaluate patient comprehension related to a health care encounter.	7
Cost	Studies that document the monetary cost of language barriers or providing interpreter services.	7
Educational Intervention	Studies that include an intervention to teach students, residents, or clinicians how to speak another language or work with LEP patients.	5
Encounter Duration	Studies that measure how language barriers or use of interpreters affect the length of a health care encounter.	7
Interpreter Error	Studies that evaluate the frequency of interpreters' errors.	2
Interpreter Evaluation	Studies that evaluate the quality of interpreters.	1
Interpreter Practice	Studies that document the types of interpreting practices used by clinicians or institutions.	20
Interpretation Preference	Studies that explore the provider's or patient's preference of different methods of interpretation.	9
Interpreter Role	Studies that explore the value of different types of interpreters, e.g., "message converter" vs. cultural broker.	8
Need	Studies that document or quantify the patient's or clinician's need for language assistance.	19
Measured Outcomes	Studies that examine the relationship between language barriers and measure outcomes, including utilization and health status measures.	22
Patient-Reported Outcomes	Studies that examine the relationship between language barriers and patient-reported outcomes, including utilization and health status measures.	14
Satisfaction	Studies that examine the relationship between language barriers, use of interpreter services, and patient satisfaction.	14

Note: N > 151 articles because some articles address more than one topic and are counted more than once.
Source: Adapted from E.A. Jacobs, N. Aggar-Gupta, A.H. Chen, A. Piotrowski, and E.J. Hardt, *Language Barriers in Health Care Settings: An Annotated Bibliography of the Research Literature*. Woodland Hills, Calif.: California Endowment, 2003.

seem like a lot, the various topics' uneven distribution reveals a lack of research depth in many areas pertaining to language barriers. For example, although a number of articles document the negative impact of language barriers on access to care ($n = 28$), only 1 article evaluated the quality of medical interpreters. Similarly, 57 of the 151 articles focused exclusively on Spanish. While Spanish is the most common language, after English, spoken in the United States, given its similarity to English in grammatical structure and medical concepts, findings based on the sole study of Spanish may not be generalizable to languages such as Hmong, which only recently acquired a written language (Barrett et al. 1998), or Cambodian, which does not have an equivalent word for *hepatitis* (Jackson et al. 1997). Ethnic groups' cultural and demographic differences could also lead to different findings.

Under each of the following three questions, we suggest what answers the literature provides and where further research is needed.

Do Language Barriers Have Important Consequences for LEP Patients?

Access to Health Care. Numerous articles show that people with limited English proficiency (LEP) are less likely to receive the care they need. These studies found that when compared with English speakers, people whose main spoken language is not English are less likely to understand the processes necessary to become insured (Feinberg et al. 2002) and to remain insured (Jang, Lee, and Woo 1998), to receive preventive care (Harlan, Bernstein, and Kessler 1991; Hu and Covell 1986; Liao and McIlwaine 1995; Marks et al. 1987; Naish, Brown, and Denton 1994; Solis et al. 1990; Stein and Fox 1990; Woloshin et al. 1997), to have a regular source of primary care (Jang, Lee, and Woo 1998; Kirkman-Liff and Mondragon 1991; Weinick and Krauss 2001), and to receive timely eye, dental, and physical examinations (Kirkman-Liff and Mondragon 1991).

Comprehension and Adherence. Patients whose primary language is not English have a poorer understanding of the care they have received (Cass et al. 2002; Crane 1997; Kazzi Bonacruz and Cooper 2003; Lasater et al. 2001; Shapiro and Saltzer 1981) and are less likely to follow recommendations for treatment and follow-up visits, compared with patients whose understanding of English is better (Apter et al. 1998;

Karter et al. 2000; Kravitz et al. 2000; Manson 1988; Sarver and Baker 2000).

Quality of Care. Compared with similar patients who speak English, LEP patients are more likely to be admitted to the hospital (Lee et al. 1998), to have longer hospital stays (John-Baptiste et al. 2004), and to receive insufficient anesthesia when admitted to the hospital (Carnie and Perks 1984; Devore and Koskela 1980; Todd, Samaroo, and Hoffman 1993). Furthermore, asthmatic children with LEP families are more likely to be intubated (LeSon and Gershwin 1995a and 1995b). LEP patients are also at risk of receiving unnecessary diagnostic testing (Wardin 1996) and may be at greater risk of suffering medical errors compared with those who speak English well (Flores et al. 2003; Ghandi et al. 2000).

Satisfaction. LEP patients are less satisfied with their health care. Latinos who speak Spanish have been shown to be less satisfied with their communication with health care providers (Carrasquillo et al. 1999; David and Rhee 1998; Morales et al. 1999) as well as with the care they receive (Carrasquillo et al. 1999) and are more likely to report overall problems with their care than English speakers are (Carrasquillo et al. 1999; David and Rhee 1998; Weech-Maldonado et al. 2001). In addition, health care providers are less satisfied with their interactions with patients when they face a language barrier (Hornberger, Itakura, and Wilson 1997).

Research Need. All together, this research strongly suggests that language barriers adversely affect LEP patients in their access to health care, comprehension and adherence, quality of care, and patient and provider satisfaction. Not all these studies, however, controlled for possible confounding factors such as differences in the patient's age, insurance, or degree of illness. In addition, even the methodologically rigorous studies did not always explain how language barriers contributed to the differences between LEP and English-speaking patients. For example, despite adjusting for acuity of illness, it is not clear why LEP persons are admitted to the hospital more frequently (Lee et al. 1998) and have longer hospital stays (John-Baptiste et al. 2004). Physicians may be more likely to err on the side of caution when they feel they cannot rely on the patient's history; LEP patients may not receive appropriate outpatient care as quickly as English-speaking patients do; or other, unmeasured factors may be involved. In order to address these disparities, we need to go beyond just documenting the relationship between LEP patients and

their receipt of health care and conduct more rigorous research to better understand how language affects care.

Are There Effective Interventions to Reduce Language Barriers in Health Care Settings?

In general, the only two broad categories of interventions to reduce language barriers in the clinical setting are matching LEP patients with providers who speak their primary language and finding a third person (an interpreter) who speaks both English and the patient's primary language. We found thirty-five articles that investigated the impact of these two interventions on access to and quality of health care. Six studies examined the effect of having LEP patients matched with providers who spoke their primary language (language concordance). Three studied the effect of teaching medical Spanish to resident physicians.

Twenty studies looked at the impact of interpreters on access to and quality of health care, either measuring the effect of professional interpreters who were employed specifically to interpret (seven studies) or measuring the effect of untrained or "ad hoc" interpreters, like another patient, family member, friend, untrained employee, or nonfluent health care professional (thirteen studies). Several of the studies did not distinguish between professional interpreter services and ad hoc interpreters and are included in the thirteen studies in the ad hoc category. Two studies compared different methods of professional interpretation. Finally, four studies reported findings on interventions to increase medical residents' awareness of and appropriate use of professional interpreter services.

Language Concordance. Studies of language-concordant provider-patient pairs found higher rates of patient satisfaction (Freeman et al. 2002; Lee et al. 2002) and also reported better well-being and functioning (Perez-Stable, Napoles-Springer, and Miramontes 1997), asthma medication adherence (Manson 1988), patient visit recall, and interaction between patient and physician (Seijo, Gomez, and Freidenberg 1991), compared with discordant pairs. In addition, physicians with greater Spanish-language proficiency received from their Spanish-speaking patients higher interpersonal processes of care ratings, including those related to cultural competence (Fernandez et al. 2004).

Language Training. Three studies described the impact of short-term (twenty to forty-five hours over four to fifteen weeks) educational

interventions to teach Spanish to emergency medicine resident physicians. All the studies demonstrated an increase in participant-reported comprehension and fluency (Binder et al. 1988; Mazor et al. 2002; Prince and Nelson 1995). One found a significant improvement in patients' ratings of interpersonal processes of care and a subsequent decrease in their use of interpreter services (Mazor et al. 2002). But another study found that these residents made a number of both major (e.g., misunderstanding of symptoms) and minor (e.g., technically incorrect grammar) errors in their conversations (Prince and Nelson 1995). After the training, they also were less likely to ask for an interpreter (Prince and Nelson 1995).

Professional Interpreters. The studies examining the impact of professional interpreter services found that these services increased LEP patients' receipt of primary and preventive care (Jacobs et al. 2001), allowed LEP patients to receive diabetes care that was better than or equal to that received by English-speaking patients (Tocher and Larson 1998), and increased their adherence to follow-up (Bernstein et al. 2002). The use of professional interpreters in the emergency department (ED) also reduced emergency department costs and utilization, compared with encounters when there was a language barrier and ad hoc or no interpreters were used (Bernstein et al. 2002; Hampers and McNulty 2002). It is not clear what the impact of professional interpreters is on patients' length of visit, as some studies found an effect and others did not (Fagan et al. 2003; Kravitz et al. 2000; Tocher and Larson 1999).

Professional Interpreter Modalities. Only two articles compared professional interpreters using different technological modalities of interpretation. One study compared remote simultaneous medical interpretation (RSMI), in which the interpreter is off site and communicates with the doctor and patient through microphone headsets, with traditional face-to-face interpreting in well-child visits (Hornberger et al. 1996). The RSMI method had fewer interpreting inaccuracies, and both patients and physicians preferred this form of communication. In the other study, satisfaction and patient enablement scores for interpreted encounters were compared using face-to-face, telephonic, and videoconferencing interpreters (Jones et al. 2003). The patient enablement scores, defined as how well patients were enabled by their physicians to understand and cope with their condition, were highest for the face-to-face and telephone-interpreted encounters, with comparable satisfaction across the groups.

Ad Hoc Interpreters. Studies examining the impact of ad hoc interpreters on care had mixed results. Several studies by Baker and colleagues

found that compared with ED encounters in which an interpreter was needed but not used, encounters in which an interpreter was needed and used resulted in greater patient satisfaction, better patient-reported comprehension, and more patients receiving a follow-up visit for their condition when leaving the ED (Baker, Hayes, and Fortier 1998; Baker et al. 1996; Sarver and Baker 2000). But they found no difference in adherence to follow-up recommendations (Sarver and Baker 2000). The use of ad hoc interpretation in the psychiatric setting was shown to increase the satisfaction of those LEP patients who requested and received interpretation (Kline et al. 1980), as well as the patient-centeredness and consequently symptom and concern resolution for those LEP patients who had an interpreter, compared with those who did not (Henbest and Fehrser 1992). Nonetheless, ad hoc interpreters may also lead patients to ask fewer questions and limit the physician's responses (Rivadeneira et al. 2000), and they do not appear to reduce utilization of care (Kravitz et al. 2000; Waxman and Levitt 2000). In addition, the use of ad hoc interpreters was found to lead to less satisfaction by the LEP patient and physician, compared with the use of professional interpreters (Baker, Hayes, and Fortier 1998; Hornberger, Itakura, and Wilson 1997). In addition, ad hoc interpreters were discovered to make errors in interpreting that would likely lead to clinically significant errors in communication (Flores et al. 2003) and to increase the likelihood of misdiagnosis and delivery of poor or inaccurate treatment (Bischoff et al. 2003; Chan and Woodruff 1999; Elderkin-Thompson, Silver, and Waitzkin 2001; Price and Cuellar 1981; Vasquez and Javier 1991).

Trainings on Interpreter Services. Studies examining the effect of training of physicians and health care providers about when and how to use interpreter services found that such training improved knowledge and attitudes and made the use of these services more likely (Gany and Thiel de Bocanegra 1996; Stolk et al. 1998). These findings are supported by other literature showing that providers with more training on this topic are more likely to ask for interpreter services when needed (Kalet, Gany, and Senter 2002; Karliner, Perez-Stable, and Gildengoren 2004).

Research Need. The thirty-five articles we identified in our literature search suggest there are effective methods to reduce language barriers and improve outcomes for LEP patients. Language-concordant providers have a positive effect on patients' recall, adherence, and satisfaction, while professional interpreters favorably affect utilization, quality, and adherence. Ad hoc interpreters seem to have a mixed effect, as does

the intensive language training of medical residents. Although patients seem to appreciate these efforts, as evidenced by their greater satisfaction, they may be at greater risk for clinically significant errors. The impact of these interventions on a variety of outcomes should be studied, with particular focus on the high-priority outcomes of access, quality, and medical errors.

Unfortunately, the literature provides little guidance on which interventions, and under which circumstances, best reduce language barriers. When purchasers, insurers, or clinicians decide to request, cover, or implement linguistic access services, they have little empirical evidence to help them decide which interventions should be at the top of their list. Should they offer incentive pay for bilingual providers; should they hire professional interpreters; or both? When considering professional interpreter services, when are face-to-face interpreters better than a telephonic interpretation; when is it all right to use videoconferencing or RSMI? It would be helpful to know how the quality of interpretation, the patients' and providers' preferences, logistic challenges, and expenses vary among these options.

Similarly, there is little guidance on determining who is a qualified bilingual provider and who is qualified to interpret. No articles established what type of training makes an interpreter qualified to be an interpreter or validated an evaluation process for testing interpreters. This leaves health care stakeholders wondering what type of training, if any, should be required of interpreters and how an interpreter's skill can be evaluated. Assessments of provider language proficiency and interpreter skill need to be standardized, tested, and validated so that insurers and providers can make informed decisions about whom they should hire to provide interpretation or care in a language other than English. In addition to these assessments, an evaluation of interpreter training and training components would help trainers decide how best to prepare interpreters for practice and would help providers know what they are getting when they hire a "trained" interpreter.

Finally, we need more research on how best to establish and use interpreter services. As we noted earlier, the United States has laws and regulations that "require" most health care organizations to provide linguistic access to their patients, but many organizations still do not offer them. In order to encourage the establishment of these services, we need more research on why they are not provided and what can be done so that they are. Similarly, for providers, having interpreter services available to

clinicians does not guarantee linguistic access. Rather, providers must use these services in a way that make good communication more likely. We need more research on how best to teach health care providers how to work with interpreters and how to reduce the obstacles to using their services.

*What Are the Costs of Offering or Not Offering
Effective Linguistic Access Services
for LEP Patients?*

Notably missing in the current literature is research on the cost of language barriers. Only three studies directly measured the cost of these barriers. Two studies found that the use of ad hoc services has an opportunity cost for institutions in the form of staff time lost to interpreting rather than performing their primary job (Drennan 1996; Rader 1988). Another, based in a pediatric emergency department, found that a language barrier between the physician and the parents accounted for an increase of \$38 in charges for testing and a twenty-minute-longer ED stay (Hampers 1999). Three additional studies investigated the costs and potential cost savings of offering professional interpreter services. They discovered that the cost of providing these services is quite low relative to most health care costs (Jacobs et al. 2004) and that they can reduce the cost of care provided in the ED (Hampers and McNulty 2002) and follow-up visit charges following the ED evaluation (Bernstein et al. 2002).

Research Need. As health care costs continue to rise faster than inflation, health care purchasers, insurers, regulators, and providers ask how much it will cost to ensure linguistic access and whether the benefits are worth the costs. Unfortunately, as we just explained, there is scant information about both the costs of unaddressed language barriers in health care and the costs of ensuring linguistic access. Purchasers—particularly employers with a high percentage of immigrant workers—would benefit from knowing whether or not lost work time, due to delayed diagnoses, unnecessary repeat visits, and preventable medication errors stemming from miscommunication in the medical encounter, is costing them money. Similarly, policymakers would benefit from knowing how language barriers contribute to such societal costs as morbidity, mortality, and lost productivity and wages. Insurers would benefit from data on

the cost of unnecessary hospitalizations or aggressive diagnostic testing that arise from “defensive medicine” when clinicians are unable to elicit a medical history. On an institutional level, providers would benefit from information about inefficiencies and opportunity costs when bilingual physicians and nurses are used as interpreters, and on an individual level, clinicians would benefit from knowing the risks that language barriers might lead to malpractice costs. Last, but certainly not least, researchers need to explore the direct and indirect costs of language barriers for LEP patients and communities.

Methodologic Rigor: Challenges and Recommendations

We also identified in our literature review some recurrent methodological problems that limit the strength of the conclusions from many of the studies. The first problem is that many investigators do not clearly define the LEP population that is the focus of their research. Consequently, the definition of LEP varies by study; it may be based on patients’ reports, providers’ perceptions, or the use of interpreters. Accordingly, the lack of a standardized measure of limited English proficiency limits readers’ ability to compare studies or draw conclusions about what the study findings might mean for a particular population. Future research should concentrate on measuring limited English proficiency. Is a person considered to be LEP if he or she cannot understand a standardized explanation of an illness and its treatment? Is a person considered to be LEP if his or her English is not good or he or she prefers communicating through an interpreter? Deciding on a valid measure of English proficiency for various languages not only will help improve the rigor of research, but it also may help providers determine when a patient needs linguistic assistance services.

The second problem is similar: investigators exploring the impact of interpreters on health care often do not clearly define the interpreters being studied. The type of interpreter may not be defined at all, or the interpreters being studied may be a mix of both ad hoc and trained. Again, this lack of clarity limits readers’ ability to compare studies or draw unambiguous conclusions from a study’s findings. For example, we know from some of the research cited in this article that professional interpreters are likely to be better at improving communication.

Therefore if a study of both ad hoc and trained interpreters cannot determine whether providing linguistic access has an effect, the ad hoc interpreters may be canceling out the effect of the trained interpreters. In order to avoid this problem, investigators should clearly distinguish the types of interpreters they are studying.

Investigators should also clearly define what qualifications interpreters should have. A problem in the field of interpreting, and subsequently for researchers wanting to study interpreter service interventions, is that currently there is no standardized certification or licensure process for medical interpreters. Therefore the training and qualifications of “professional interpreters” or “staff interpreters” can vary tremendously across studies, ranging from a few hours of formal training, to a master’s degree in interpreting, to years of job experience. Most often the training is not described. Except in the case of ad hoc interpreters, who by definition have no training, investigators should determine what makes the interpreters in their studies qualified to be interpreters, including whether and what kind of training they have received and whether their language and interpreting skills have been formally assessed. This should be done for “dedicated interpreters,” those whose full-time job is to interpret, telephone interpreters, and bilingual staff, such as nurses, who are used to interpret. This will allow readers to evaluate the quality of the study intervention.

It is also surprising that many studies do not control for potential confounding factors that could account for their findings. For example, many studies do not control for socioeconomic status, literacy, or degree of acculturation, all of which could influence or interact with the impact of language barriers on health care or the effects of interpreter interventions. Another common critique of interpreter intervention studies is that few of them have met the methodological “gold standard” of a randomized controlled trial. Unfortunately, in many cases, a randomized controlled trial would be considered unethical, given the relatively strong finding that language barriers hinder the delivery of care. In other situations, however, a case could be made for using this design if, for example, one were comparing usual care, such as telephone interpreting, with a hypothesized improvement in care, such as face-to-face interpreting. In addition, intervention studies should be conducted prospectively, with a before and after design, or with an adequate control group so as to isolate the effect of the linguistic access intervention on health care outcomes and quality.

The Role of Funders

Research policymakers and funders have an important role to play in improving scientific rigor and reducing the research gaps we have identified in our review. Better-quality data will lead to better science. If large databases, such as the Medical Expenditure Panel Survey, included detailed linguistic data about its subjects and whether or not they had linguistic access services provided for them, researchers could use this database to conduct rigorous, controlled studies of the role of language barriers and interpreter use in the cost and quality of care. Data such as standardized measures of the participants' language proficiency and those participants' access to language-concordant physicians, professional or ad hoc interpretation, coupled with quality and utilization data, would increase both the quantity and quality of research on this topic.

Foundations such as the Commonwealth Fund, the Robert Wood Johnson Foundation, and the California Endowment have helped by funding research in this area. Federal research agencies that grant most of the research funds in the United States have offered little money for research in this area, which has hurt the quantity, quality, and rigor of this research. The National Institutes of Health, particularly the National Center on Minority Health and Health Disparities, and the Agency for Healthcare Research and Quality could address these deficiencies by including language barriers in health care as one of their explicit funding areas, with a focus on the questions we have proposed.

Discussion and Conclusion

We outlined three broad areas of need for more research on language barriers in health care, including research documenting the ways in which language barriers affect health and health care, studies investigating the efficacy of linguistic access service interventions, and evaluations of the cost of language barriers and efforts to overcome them. Within each of these broad areas we asked more specific questions and made recommendations.

Clearly, we need more and better-quality research on the impact of language barriers on health care and how interventions to improve linguistic access affect the cost and quality of health care delivered to persons with limited English proficiency. While our proposed research agenda is

not designed to be comprehensive in addressing all aspects of language barriers in health care, we have touched on what we believe are the most pressing issues. The importance of future research on this topic cannot be underestimated. Given the rapid increase in the number of Americans reporting that they speak English "less than very well," there is a critical need for the research community to provide health care providers and policymakers with the evidence they require to design and effectively implement linguistically accessible services to LEP patients. Grant makers, both public and private, can help advance research in this area by supplying the funds and data that are needed to encourage and enable this important research.

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